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A Technique of Accurately Assessing Suitability for Employment[1]

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THIS paper describes a technique of assessment of suitability for employment which is applicable to all age groups but because the older age groups present the most difficulty and require the most refined techniques of study, the method was set up to deal specifically with this problem and with the problem of rehabilitation services. Simplifications of the method are used for other age groups. The problems of our aging citizens are manifold and I am sure they touch your lives in your daily work as well as in a very personal sense. The fact that you and I realize, gradually or suddenly, that we, too, are growing old gives to the solution of the problems of aging a certain urgency.

This urgency has been, I am sure, the underlying cause of a variety of approaches to an aging society, some based on valid theses and others on unproved hopes. In the preface of a recent textbook a well-known student of the subject stated that action lagged far behind the knowledge available in the field of aging. I contend that the reverse is true. Our knowledge is so fragmentary that we can only nibble at the periphery of the problem. We cannot provide specific treatment for problems, we can only offer good supportive care. In the field of medicine, with which we are most familiar, this is very obvious. Do we know what causes, how to prevent, or how to cure atherosclerosis? How many malignancies can we prevent or cure?

The older working population might be described as those older members of the working group in whom the degenerative diseases have not produced sufficient deterioration to interfere extensively with their efficiency. These people work under many handicaps but they also have a few advantages.

[1]Presented at the annual meeting of the Ontario Public Health Association, Toronto, September 28–30, 1959.

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They have been at their work longer and know it better; they are more reliable and, in employment where seniority counts, they have greater credit; their absentee record is also better than that of younger men and women. Finally, they do not change jobs so frequently or get married and leave. The disadvantages are that they tend to be conservative, middle-of-the-roaders, they are settled and dislike change. Towards the end of their work life they may find it very difficult to learn new skills, to accept new ideas or to make decisions. Although their absentee record is good, when they do have an illness it is usually catastrophic involving a long period of invalidism and perhaps retirement.

The generally accepted retirement age of 65 was introduced in the Bismarck era when very few males lived to be 65 years of age. Now, over 50% of males live to be 65 and 50% of females live to be 70. At the period when pension schemes began to give older people the beginning of some security, the age of 65 was fixed in our industrial pattern as the proper age for retirement. It was thought that the younger wage earner with growing children should have priority over the older person who would receive a pension. It is now realized that such a retirement plan is too great a burden on our economy for at least two reasons. There are too many older persons alive to be supported successfully by the decreasing percentage of people under age 65 who are now expected to support, in effect, their children, grandparents, and great-grandparents. In addition, in our expanding society there will probably never again be a true net surplus of workers. So we need fit, older workers and we cannot afford to have them idle and unproductive.

With the growth of unions, company-paid pension plans, and casualty insurance plans, an anomalous situation has arisen. Those organizations which treat their employees best, or for whose employees unions have achieved the most social security, are those which must discriminate against the hiring of new older workers. An old man of 35 or 40 wanting employment at a factory with a strong pension and insurance scheme is a liability. When he retires he will not have enough to live on and may become a moral charge on the union or company. The cost of casualty insurance rises many times after age 50. The 40-year-old new employee has not paid in his share of casualty insurance during his 20's and 30's when he would have been accumulating a surplus to apply against the more expensive later years of his insurance.

The solutions to these problems are beyond the medical profession. The solutions are easy to state but much more difficult to provide. These solutions are the universal vesting of pension rights at some fixed age and the portability of casualty insurance.

Fitness to Work

The medical profession can deal with the remaining problems—those of fitness to work. There are two approaches to the problem of the older worker. One is to maintain a compulsory retirement age but raise it, to 68, 69, or 70 years. The other is to permit those who are fit to work to continue beyond a fixed retirement age on an annual basis subject to their remaining fit. In either case an earlier voluntary retirement age is required at which pension benefits

cease to increase except by conversion, because there is an increasing percentage of older persons who become unfit for their work beginning in the 50's and increasing into the 70's. In both cases fitness to work should be assessed by the medical profession.

If a company is to permit and encourage older workers to stay on it must have the knowledge that they are fit for their work and will probably stay that way for a predictable time, one year, for example.

Functional Profile

Five years ago the Deputy Minister of the Department of Veterans' Affairs, General E. L. M. Burns, and his Director-General of Treatment Services, Dr. W. P. Warner, asked my colleagues to study this problem. It seemed evident that what was needed was an accurate appraisal of ability to function. This is best obtained by a complete medical, psychological, social, and economic assessment. One cannot, however, pass six or seven foolscap sheets of history and findings, plus raw psychological data, to the personnel branch or to a shop foreman. There must be an abstract of the findings which a layman can understand and the abstract must be standardized so that one person can be compared with another, one job with another, and the capacities of one person compared at different times in his life.

There are many systems in use for this purpose. One of the best of these is the functional profile. The PULHEMS functional profile used by our armed forces is a good example. PULHEMS, however, was constructed and modified to suit armed forces requirements and could not be expected to work, and in fact it did not work, in a civilian setting. Our group went back to the original idea of a functional profile and hammered one out tempered to the needs of commercial and industrial concerns. It is inevitable that as we are abstracting the physical and mental fitness of the same human beings in a different setting there should be some similarities. We believe that the errors which have crept into the PULHEMS and the many other profiles in specialized use today have been eliminated and that it is as easily understood by laymen as is PULHEMS.

In addition to building and standardizing a functional profile of medical and mental fitness we have also built and standardized various special profiles for use in assessing such things as fitness for promotion and a framework to guide counsellors in helping with retirement planning. Of course every profile had to be standardized against people actually working on the job before we could know medically what every level of competence meant. Each job in the organization then had to be assessed against these standards. There is no use assessing the employee unless you assess also the minimum standard required for the job in which he is to be employed. Finally, we prepared a manual which is complete but is still in manuscript.

The average efficiency of supervisory personnel in assessing suitability for promotion or retention is very poor except when they are assessing technical skills. It is usually estimated to be about 50% right and 50% wrong. There are many factors in this inaccuracy which are too numerous to present here. By substituting group judgment for individual judgment the accuracy can be improved somewhat. By adding an accurate objective appraisal of the man

and his environment the accuracy can be raised to the satisfactory level of not more than 2% error per year. Our methods have been developed so that a company starting to use our method can adapt it to suit the climate of management and union opinion in the company and can increase its accuracy by stages as it becomes expedient.

An assessment of humans that is 98% accurate over a year is not easily made so this method is not for use in those companies where the policy is to tolerate a medical service only to the point of protecting the company against excessive insurance or compensation costs. Nor is this a method for a company with a medical officer who is a time server until he, too, can retire to live in Florida. Such companies and such medical officers do exist. This method is for a company with an aggressive enthusiastic personnel service and an equally hard-working enthusiastic medical service. It is designed for a company which wants to get rid of the 65-year compulsory retirement clause in its labour contracts and which has a union that is equally insistent on the rights of the older employee to work if he is fit, is needed and wants to work. This method will therefore come gradually into use as its effectiveness is noted. Our basic profile will look very familiar to those who have had military service. It is called GULHEMP.

Stability was not what we wanted to assess but rather total personality in the work environment, so we had to substitute "*P*" for "*S*" at the end of the profile. This meant that *General Physique* had to begin with a "G" instead of "P". To get adequate separation of differences between degrees of competence in heavy industry and in rehabilitation centers we had to stretch the number of degrees of competence from 5 to 7.

We have standardized the supporting medical data in such a way that, for example, if a company needs a closer examination of any function such as pulmonary function the "C" for Chest can be separated from General Physique by merely deleting references to Pulmonary Function in the medical data and setting up a parallel "C" factor. This will not affect the statistical validity of summaries prepared from the company's work as the material can easily be recombined. The fact that one may not be able to pronounce the code at the top does not really matter. The profile must remain as such. It must not be distorted as was the British PULHEEMS.

Many errors crept into previous profiles. One of the most serious in the PULHEMS was the necessity of combining prognosis and the results of examination into one profile. We prefer to prepare a stat profile from examination and then, on the basis of clinical knowledge and the statistical data available, prepare a second profile stating the probable situation in the required time. This might be one year in the case of a 66-year-old employee requesting an extension, or 15 years in the case of an 18-year-old person coming to his first job.

"*R*" gradings are used as they were in the PULHEMS. They mean (1) patient undergoing treatment and expected to improve or results unpredictable and (2) patient requires treatment and is willing.

Expected downgradings are shown in the prognostic profile. Suffixes are not an intrinsic part of the profile but may be used to shorten the medical

officer's remarks to Personnel. As an example, if a company has a dominant medical problem such as allergies to acrylic resins, repeated references to this problem may be avoided by adding a suffix to the profile which indicates the profile is only valid if the employee is not in contact with the irritant.

Hiring profiles are prognostic profiles adjusted upwards from minimum profiles to exclude rapidly changing or progressive disabilities depending on the training time, labour turnover, pension and insurance commitments of the company.

There are many other aspects of this work which could be usefully discussed including the intelligence and personality of supervisory personnel, the problem of uncovering a suspected mild sociopath, of obtaining data on group attitudes within a company, and the social and economic survey of the older worker as a service and as a guidepost for future service.

Summary

The paper describes a method of examining all employees, especially those in the older age groups and those with rehabilitation problems. The method provides accurate data on the fitness of all employees to work and includes the probability of their retaining such fitness in the future. The results obtained by use of this method are related directly to job requirements. The information obtained is therefore useful for comparison between employees and between jobs at specific periods.

Résumé

Cet article décrit une méthode d'examen que l'on peut utiliser chez tous les employés, spécialement les plus âgés et ceux qui présentent des problèmes de réadaptation. La méthode fournit des données précises sur l'aptitude de tout employé à une tâche quelconque et indique la probabilité pour l'employé de se maintenir apte à cette tâche dans l'avenir. Les résultats obtenus au moyen de cette méthode sont en relation directe avec les exigences de la tâche. L'information ainsi obtenue est par conséquent propre à permettre des comparaisons entre les employés et entre les tâches à des intervalles donnés. (Trad.: Dr F. J. Tourangeau.)

The Rodent- and Avian-Borne Diseases in Canada[1]

J. A. McKIEL,[2] M.Sc., Ph.D.

THE role of rodents and birds in perpetuating diseases which affect man is being realized more fully as studies are pursued. This paper briefly reviews the roles of rodents and/or birds in western equine encephalomyelitis, Rocky Mountain spotted fever, tularemia, plague, leptospirosis, and ornithosis.

Western Equine Encephalomyelitis (WEE)

The organism causing this disease is a virus which has been responsible for severe epidemics in the prairie provinces of Canada. The most extensive epidemic occurred in 1941 and included a limited outbreak in horses in Ontario (30). A milder epidemic took place in 1947 and since then a few cases have been recognized each year in the western provinces. The only known human case east of Manitoba was reported from Montreal in 1957 by Pavilanis *et al.* (34).

Several species of mosquitoes have been demonstrated to be potential vectors of WEE. In the western United States, *Culex tarsalis* has been shown to be the only mosquito with population numbers and incidence of infection in nature sufficient to account for the occurrence of the observed human and equine cases. In Manitoba, *C. tarsalis* and *C. restuans* have been found naturally infected (28, 32).

One very important problem associated with WEE is the method by which the virus survives the winter. The wood tick, *Dermacentor andersoni* has been shown capable of transmitting the virus to its offspring via the egg stage (42). WEE virus has been isolated from naturally infected ground squirrels (*Citellus richardsonii*) (19) and *C. beecheyi* as well as tree squirrels *Sciurus griseus* (27). Ecologic studies, however, indicate that small mammals and ticks do not play a significant role in maintaining the virus in nature.

C. tarsalis which passes the winter as an adult has been shown capable of infecting a susceptible host 109 days after itself becoming infected (3). This, coupled with the fact that WEE virus has been isolated from *C. tarsalis* in California in every month of the year except December (37), appears to point to *C. tarsalis* as the winter reservoir. Since the mosquito is unable to pass the virus from stage to stage, a necessary condition to the over-wintering of the virus by the adult is that it must feed on blood prior to beginning hibernation. However, evidence is rapidly accumulating that blood-engorged *C. tarsalis* does not hibernate successfully and therefore is not the mechanism by which the virus is maintained over winter (39).

The usual hosts of *Culex* mosquitoes are birds. It has been suggested that

[1]Presented at the Jubilee Meeting, Canadian Public Health Association, Montreal, Quebec, June 1–3, 1959.

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blood-feeding bird mites maintain the virus in nature by passing it to succeeding generations through the egg stage and that *Culex* mosquitoes carry the virus from birds to mammals including man.

In 1958, Reeves *et al.* (38) reported finding that the virus may persist in experimentally infected birds for as long as 10 months and recirculate in the blood stream subsequent to the period of initial viremia. This suggests that avian hosts may become chronically infected with WEE and for long periods serve as sources of the virus for mosquito vectors. Obviously, much more information is required before this intriguing and important riddle is solved.

Rocky Mountain Spotted Fever

The etiologic agent of this disease, *Rickettsia rickettsii*, is endemic in North America. For many years this disease was thought to be limited to the Rocky Mountain regions where its vector is *D. andersoni*. It is now known that the disease occurs in eastern United States and that its vector in the east is the dog tick, *D. variabilis*. According to Cawley and Wheeler (11), cases have now been reported from all sections of the United States. In Canada, *D. andersoni* is abundant in the dry belt areas of British Columbia, in Southern Alberta and Southwestern Saskatchewan. *D. variabilis* is distributed from Eastern Saskatchewan to Nova Scotia. The known occurrence of spotted fever in Canada is limited to the area occupied by *D. andersoni* (22). The number of cases reported in Canada from 1935 to 1958 was as follows: Saskatchewan 2, Alberta 7, British Columbia 6 (13).

The rabbit tick, *Haemaphysalis leporis-palustris*, is another proved carrier of spotted fever. However, it tends to restrict its feeding to rabbits and certain birds and for this reason is not considered important in the direct transfer of the infection to man. Parker *et al.* (33) suggested that infected rabbit ticks may be important in the spread of spotted fever from one area to another through being carried considerable distances by ground-frequenting birds. The rickettsiae would then pass to rabbits which in turn would infect *Dermacentor* ticks.

Ticks function not only as vectors but also as reservoirs of spotted fever by passing the rickettsiae from each life history stage to the next including transfer from adult through the egg to the next generation. Undoubtedly, rodents also serve as reservoirs but in spite of extensive studies on this disease, the rickettsia was not isolated from a wild-caught mammal until 1954 (17).

R. rickettsii which has overwintered in ticks requires "reactivation" before it becomes infective. This phenomenon occurs inside the tick through association of the rickettsiae and blood of a host for a period of from 2 to 8 hours or by exposure of the tick to warmth. Price (36) has demonstrated that this reactivation comes about as a definite qualitative and not merely a quantitative change in the rickettsiae within the tick.

A strain highly virulent for man may prove relatively avirulent for guinea pigs. Humphreys (21) found that a strain isolated from a fatal case in Alberta caused only moderate lesions and no deaths in over 20 passages in guinea pigs. Ticks collected from the area in which the patient had become infected yielded only a low grade immunizing strain of the rickettsia. In fact, strains of *R. rickettsii* isolated in Western Canada usually have shown a low level of pathogenicity for guinea pigs.

Tularemia

Tularemia is a bacterial disease of rodents, game birds and man and is caused by *Pasteurella tularensis*. The disease has been recorded from Newfoundland to British Columbia with over 147 human cases reported between 1924 and 1958 (13). A serological survey of Indians in Northern Canada reported by Greenberg and Blake in 1957 (18) showed that tularemia is endemic in certain areas particularly in Northern Manitoba and around James Bay.

Tularemia may be spread by a variety of methods including blood-feeding arthropods. *H. leporis-palustris* is largely responsible for maintaining the disease in nature. Humphreys (21) stated that tularemia was encountered almost every year from 1939 to 1954. *P. tularensis* was isolated from ticks (*H. leporis-palustris*, *D. andersoni* and *D. variabilis*), fleas (species not given) from Richardson ground squirrel and yellow-bellied marmot (*Marmota flaviventris avara*), tissues from deer mouse (*Peromyscus maniculatus*), meadow mouse (*Microtus pennsylvanicus*), house mouse (*Mus musculus*), Norway rat (*Rattus norvegicus*), Richardson ground squirrel, beaver (*Castor canadensis*), and the black tern (*Chlidonias niger aurinamensis*). An epizootic in 1952–1953 in beavers and muskrat of Waterton Lake National Park, Alberta, was described by Banfield (2). *P. tularensis* was isolated not only from the animals concerned but also from water samples from the affected streams.

Plague

Plague is a disease of rodents and man and is caused by *Pasteurella pestis*. All evidence indicates that plague epidemics on the scale reached in the past are not likely to be repeated. Plague remains, however, entrenched in wild rodent populations in a number of areas in the world posing the threat of spilling over into the domestic rodent community and from there to man. Actual transfer of plague from wild rodents to commensal rats has been demonstrated to have occurred in the San Francisco area (24).

In Canada, there is a fairly large area in Southern Alberta and the adjoining section of Saskatchewan where plague occurs in Richardson ground squirrels (9, 16). In British Columbia, plague has been isolated once from fleas off the yellow-bellied marmot but not at all from many thousands of rats collected along the Vancouver waterfront (21).

There has never been a laboratory-confirmed human case of plague in Canada. A case which in retrospect appears to have been plague occurred in a mink rancher in Alberta who had fed Richardson ground squirrels to his mink. When the mink began to die he salvaged the pelts but in so doing cut himself with the skinning knife. He developed typical symptoms of plague and died. Ground squirrels from the area where the victim had made his collections for mink food were found to be harboring *P. pestis* (9).

In the United States, emphasis in studies on rodent reservoirs of plague has shifted in recent years from ground squirrels to small field voles and mice. In the San Francisco Bay area, *Microtus californicus* is thought to be the chief plague reservoir because it exhibits a high degree of resistance to *P. pestis* and is parasitized by all of the important plague vectors as well as by 90% of all fleas of all species collected in the area (25). Although several species of mice

were tested for plague at the Kamloops Branch Laboratory and found negative, the numbers checked constituted only a small fraction of the number of ground squirrels tested (21). For this reason no conclusion can be drawn by way of comparing the relative importance of the two groups of animals in harbouring plague in Western Canada.

Leptospirosis

Leptospirosis is a spirochetal disease caused by any one of over 80 serotypes of the genus *Leptospira*. For any one type, a variety of symptoms may appear simulating influenza, infectious hepatitis, infectious mononucleosis, aseptic meningitis, poliomyelitis, brucellosis and other diseases. Because of these similarities the belief is widely held that human leptospirosis is much more common that statistics reveal. There have been 5 cases in Canada reported in the literature (see reference 6). Three of these were caused by *L. icterohemorrhagiae*, 1 by *L. canicola* and 1 by *L. sejroe*. Two unpublished cases, both abattoir workers, occurred in Toronto in 1926. Both cases were due to *L. icterohemorrhagiae* and both patients recovered.

Members of the order *Rodentia* constitute the most important group of mammals in maintaining and spreading leptospirosis. Of 17 serotypes listed in Bergy's Manual (4) with important carrier hosts, 12 have rodents in this role. Rodents become carriers following mild infection and excrete leptospires in the urine for long periods, perhaps for life. Man acquires the infection from contaminated water or moist soil, the organisms gaining entrance to his body through breaks in the skin or through the mucous membrane.

The rat has been recognized for many years as a carrier of leptospires. Cameron and Irwin (10) reported in 1929 that 37% of rats trapped in Toronto were infected with *L. icterohemorrhagiae*. Humphreys *et al.* (23) isolated *L. ballum* from 22% of rats captured in the Fraser Valley in British Columbia. Many animals other than rodents contract leptospirosis. Only recently has the disease in cattle been recognized in Canada, (5, 14, 41).

Ornithosis

Ornithosis or psittacosis is a viral disease of birds, and is transmissible to man in whom it takes the form of an atypical pneumonia. The disease has received increasing attention in recent years.

This disease, like leptospirosis' does not depend on arthropods for its transmission nor in fact do arthropods play any significant role in its transmission. Transmission from bird to man is by means of virus-carrying dust particles from cages of infected birds and from man to man by cough droplets. Either sick or apparently healthy birds may transmit the disease.

In cases of atypical pneumonia in the United States surveyed and reported by Smadel (40) in 1943, approximately 25% were caused by ornithosis virus. Outbreaks in pigeons from which the infection was passed to persons who handled these birds have been reported by a number of workers including Meyer and co-workers (29). In Ontario, Labzoffsky (26) collected normal-appearing pigeons in three cities and showed by serological and virus isolation methods that about 25% were positive for ornithosis. A similar study of seashore birds was reported by Pollard (35) who found that over 40% of the

sera of laughing gulls (*Larus atricilla*), willets (*Catotrophorus semi-palmatus*) and skimmers (*Rynchops niger*) was positive.

Eskimos, while engaged in hunting, often eat wild birds without prior cooking. In view of this and other factors, the finding that 15% of Eastern Arctic Eskimos had antibodies to ornithosis led Hildes *et al.* (20) to consider that these Eskimos probably had had prior experience with this disease even though the serologic test is not specific for ornithosis.

The first reported outbreak of ornithosis in Canada occurred in Burnaby and New Westminster, B.C. in 1930 and involved 7 cases (12). This outbreak originated from imported parakeets. In the same year, two additional cases in Victoria, B.C. obtained their infections from sick lovebirds. Isolated outbreaks have occurred in Ontario with 24 cases having been reported up to 1958 (13). In Quebec, Genest (15) contracted ornithosis while investigating an outbreak in an aviary.

In 1957, Avery (1), Bowmer (7, 8) and Morrow (31) reported an outbreak of ornithosis among workers in a turkey-processing plant in British Columbia. The total working force at the plant numbered 35 of whom 24 became infected. The source of infected turkeys was traced to one of the gulf islands but beyond this it was not possible to determine how the turkeys had become infected. The possibility that the virus originated from wild birds was considered but thought unlikely in view of the fact that other turkey farms on the island remained free of the infection. In addition to the workers in the processing plant, two people on the turkey ranch and an eviscerator in a retail store which handled many of the turkeys developed the infection. The virus was isolated by Dr. Avery and his colleagues from killed birds which were obtained from the turkey-processing plant (personal correspondence).

Summary

In this paper, six of the more important rodent- and avian-borne diseases occurring in Canada have been discussed. The literature cited is not restricted to papers dealing specifically with the Canadian situation nor are all of the Canadian reports mentioned. It is fair to state, however, that a paucity of information exists on the distribution and ecology of these diseases in Canada.

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RÉSUMÉ

Cet article étudie les six principales maladies des volailles et des rongeurs transmissibles à l'homme et qui sévissent au Canada. Les sources bibliographiques ne se limitent pas à des publications consacrées uniquement à des faits observés au Canada; l'auteur ne cite d'ailleurs pas tous les travaux canadiens sur le sujet. Il faut convenir que la documentation sur la distribution et l'écologie canadiennes de ces maladies est loin d'être complète. (*Trad.: Dr M. Panisset.*)

Multiplication of Staphylococci During Cheese Making

The Influence of Milk Storage Temperatures and of Antibiotics

F. S. THATCHER[1] AND DOREEN ROSS

THIS paper reports laboratory experiments to demonstrate the development of staphylococci in milk and in cheese made from milk subjected to faults of inadequate cooling, contamination with antibiotics and with staphylococci.

Canadian cheddar cheese when made from unpasteurized milk frequently contains large numbers of coagulase-positive staphylococci[4,3]. The high proportion of contamination has recently been confirmed[2].

Within recent months extensive outbreaks have occurred of severe staphylococcal food-poisoning attributable to cheese made in the United States. Staphylococcal enterotoxin has been demonstrated by the present authors in specimens of Canadian cheese containing large numbers of staphyloccoci. Milk submitted to cheese factories has been shown on occasion to contain staphylococci in excess of 5×10^6/ml.

It should be appreciated that reports of food-poisoning from cheese are rare in relation to the amount of cheese consumed and that public health experience points to cheese as a safe food normally. It would appear, therefore, that the occasional demonstration of toxic cheese may be due to specific factors that may not have applied during the period when the reputation of cheese for safety was being established.

Certain faulty practices in the treatment of milk for cheese manufacture are relatively common. These are: (1) inadequate cooling of milk prior to delivery to the cheese factory; (2) submission of milk that contains antibiotics due to failure to observe the warning required to be printed on the label of all antibiotic preparations intended for intramammary infusion to the effect that milk from treated cows shall not be used for human consumption until 72 hours after the last antibiotic treatment; (3) submission of milk from cows with incipient or chronic mastitis, hence often heavily contaminated with staphylococci, some of which may be resistant to specific antibiotics.

Because preliminary experiments showed that low levels of penicillin in milk depressed the rate of multiplication of staphylococci, it seemed desirable to determine whether the presence of lactic streptococci during the cheese-making process could modify this effect of penicillin, or if a point of dilution of penicillin could be established which would reduce the rate of multiplication of

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S. lactis to a greater degree than that of staphylococcus, and hence reduce any competitive effect from the lactic culture. (Responses of lactic organisms to staphylococci have been shown to range from stimulation to inhibition, depending on the nature of the staphylococcus strain.)[1]

Materials and Methods

Milk was obtained from cows known to have received no antibiotic treatment for several months, and also from a single cow receiving chlortetracycline therapy for incipient mastitis. A mixed lactic "starter" culture containing *Streptococcus lactis* and *Streptococcus cremoris* and commercial rennet were used to clot milk in simulated cheese manufacture. The starter culture contained 1×10^9 cells/ml at time of use.

To obtain numerical estimates of the lactic streptococci present in milk, curd, and whey a number of media were tested exploratively. Using the pure starter culture as inoculum, closely similar counts were obtained after incubation at 30°C for 72 hr. from tryptone-glucose-yeast extract agar (which supports growth of lactic streptococci) and from enterococcus confirmatory agar (Difco) which is highly selective for certain streptococci. Since no report of a selective medium for *S. lactis* could be found, the enterococcus confirmatory agar was used for the isolation of lactic organisms from milk, curd, and whey. Appropriate tests were made to establish that the colonies counted as *S. lactis* were not enterococci. Colonies not resembling those of streptococci were ignored.

Staphylococci were counted by plating on mannitol-salt agar (Difco) incubated at 37°C for 48 hr. From plates of appropriate dilution of each specimen, eight colonies of micrococci resembling staphylococcus were tested for the production of coagulase. Coagulase-positive staphylococci were expressed in proportion to the numbers of the eight test colonies that were coagulase-positive. All further reference to staphylococci implies coagulase-positive organisms.

Representative isolates of the staphylococci isolated from milk, curd, and whey were tested for their sensitivity to penicillin and to chlortetracycline (CTC) by the use of standard antibiotic impregnated discs.

The effect of holding temperatures on the multiplication of staphylococci in milk

Two sources of milk were used in this test: (1) from the healthy cows whose milk contained small numbers of staphylococci, (2) from a cow that had received 426 mg. of chlortetracycline in ointment in one udder quarter 13 hours before milking. The milk from the treated quarter was diluted in the total yield of the cow (24 lb.).

To 100 ml portions of milk from the healthy cows penicillin was added to provide the following levels: 0.0, 0.01, 0.05 and 0.10 I.U./ml. Because the *Staphylococcus* content of the milk from the CTC-treated cows was unknown at the start of the test, duplicate specimens of 100 ml were inoculated with 0.3 ml of a 24-hour broth culture of a CTC-resistant strain of *S. aureus* previously isolated from milk from the same cow. This provided approximately 10^6 cells per ml.

Replicate aliquots of milk from each treatment were then kept respectively, at 10°C, 22°–25°C (room temperature), and at 22°C after having first been warmed to 35°C in a water bath. This last step was carried out in order to simulate the slow cooling that would be expected in freshly drawn milk placed in shipping containers of 80 to 240 lb. capacity and then held at room temperature without mechanical cooling.

Staphylococci were enumerated in each specimen at the start of the test and after 5 hrs. and 16 hrs. at the respective conditions.

Simulated Cheese Making

Milk from the same healthy cows as used previously was obtained at the evening milking, mixed, and appropriate portions added to flasks containing penicillin to provide the following concentrations: 0.3, 0.5, 0.7 and 0.9 I.U./ml. Half of each portion was held overnight at 10°C and half at 22°C. Duplicate

specimens from each treatment were given a process designed to simulate the early stages of commercial cheese making. (Preliminary tests had been made to determine a critical range of penicillin concentration and a suitable amount of rennet.)

Milk in 500 ml volumes was brought to a temperature of 30°C in a water-bath, and 1.5% by volume of the mixed starter culture was added. After 45 min. at 30°C rennet was added at the rate of 0.12% by volume. Complete clotting occurred within 40 min. Aliquots of 10 ml were removed for the enumeration of staphylococci and lactic streptococci. The clotted coagulum was cut at this stage into cubes about 0.25 cm^2 and its temperature raised to 40°C, the so-called scalding temperature, while the containers were under gentle agitation. This temperature was maintained for 1 hr. The curd and whey were then separated and the staphylococci and streptococci again enumerated from each. The curd was pressed and held under pressure overnight at 22 to 25°C and again sampled for staphylococcus content.

It was appreciated that not only could the comparative multiplication rates of staphylococci and lactic streptococci be influenced by the presence of an antibiotic during the cheese-manufacturing process but the presence of gross contamination due either to inadequate cooling or to external contamination sources such as manure might also influence the microbial ecology within the milk. Accordingly, milk specimens from a source with low initial staphylococcus content was inoculated with staphylococci at the respective rates of 10^3/ml and 10^6/ml. A third portion received no staphylococci from an external source. To aliquots of each of these three portions, penicillin was added in the respective amounts none, 0.05 and 0.5 I.U./ml. To half of each of these preparations a suspension of cow manure was added at the rate of 1 ml of a 1:10 suspension per 100 ml of milk. Each of the resulting preparations was further subdivided and incubated for 15 hrs. at 10°C and 22°C, respectively.

The simulated cheese manufacturing process was then carried out and the pH of each specimen was determined immediately after addition of the external contaminants, after the 15 hrs. overnight incubation, at the "clot" stage and after completion of the scalding period. Staphylococci were enumerated at each stage.

Findings

The effect of holding temperatures on the multiplication of staphylococci in milk

Table 1 records separately the data from determinations of the staphylococcus content of milk from two cows stored overnight at 10°C, at 22°C and after having raised the temperature of the milk to 35°C and holding at room temperature to simulate natural conditions in the absence of mechanical cooling. The data show that no significant multiplication of staphylococci occurred at 10°C. After 5 hrs. at 22°C an increment up to 3-fold had occurred. In 21 hrs. multiplication was of the order of 1,000-fold. The simulated natural conditions in the absence of effective cooling allowed a 30-fold increase in 5 hrs. and a range of increase from 6,000- to 10,000-fold in 21 hrs. The final population seemed proportional to initial numbers: milk initially containing 1,000 staphylococci per ml showed a population of 6,000,000 in 21 hrs. while two specimens initially containing 3,000 and 4,500/ml, respectively, allowed multiplication to 32×10^6 and 46×10^6.

The effect of penicillin and of chlortetracycline on the multiplication of staphylococcus in milk

The effect of different levels of penicillin on the multiplication of staphylococci in milk held for 16 hrs. at, respectively, 22°C and the simulated natural conditions is illustrated by the data in table 2. In the absence of penicillin vigorous multiplication occurred, though the rate of increase varied between

TABLE 1—THE EFFECT OF HOLDING TEMPERATURES ON THE MULTIPLICATION OF STAPHYLOCOCCI IN MILK

Milk Source	Holding temp. (°C)	Staphylococci: No./gm		
		Start	5 hr.	21 hr.
Cow A (Repl. 1)	10	1,000	1,100	650
(Repl. 2)		1,100	1,300	980
Cow B (Repl. 1)	10	3,000	3,400	4,500
(Repl. 2)		4,500	4,900	4,400
Average values A and B		2,400	2,700	2,600
Cow A (Repl. 1)	22–25		1,200	1,660,000
(Repl. 2)			1,800	1,770,000
Cow B (Repl. 1)	22–25		8,400	5,900,000
(Repl. 2)			14,500	5,800,000
Average values A and B			6,500	3,800,000
Cow A (Repl. 1)	35 and cooling to 22		30,000	6,000,000
(Repl. 2)			45,000	5,600,000
Cow B (Repl. 1)			900,000	32,000,000
(Repl. 2)			800,000	46,000,000
Average values A and B			400,000	22,000,000

TABLE 2—THE EFFECT OF PENICILLIN ON THE MULTIPLICATION OF STAPHYLOCOCCI IN MILK AT DIFFERENT TEMPERATURES

Milk Source	Temp. °C	Penicillin added (I.U./ml)	Staphylococci (No./ml) after addition of Penicillin		
			Start	1 hr.	16 hr.
Cow A*	22	0	1,000	2,200	4,600,000
Cow B*	22	0	1,100	1,770	650,000
Cow A	35, cooling to 22	0		2,380	13,100,000
Cow B	35, cooling to 22	0		1,220	3,000,000
Cow A	22	0.01		2,120	3,100,000
Cow B	22	0.01		1,240	400,000
Cow A	35, cooling to 22	0.01		2,280	8,000,000
Cow B	35, cooling to 22	0.01		1,620	1,350,000
Cow A	22	0.05		2,050	600,000
Cow B	22	0.05		1,680	215,000
Cow A	35, cooling to 22	0.05		2,410	1,120,000
Cow B	35, cooling to 22	0.05		1,520	620,000
Cow A	22	0.1		2,520	<100†
Cow B	22	0.1		1,730	<100†
Cow A	35, cooling to 22	0.1		1,350	<100†
Cow B	35, cooling to 22	0.1		1,810	<100†

*Two replicates of each: plates in triplicate.
†Coagulase-negative micrococci only.

the two milk specimens. Penicillin at the rate of 0.01 I.U./ml and higher, progressively reduced the rate of multiplication of the staphylococci. In the presence of 0.1 I.U./ml no coagulase-positive staphylococci could be isolated after incubation for 16 hrs. All isolates were penicillin-sensitive.

The data in table 3 illustrate the effect of a therapeutic residue (chlortetracycline) present in milk which contained a CTC-resistant strain of staphylococcus. The amount of CTC present was not known but it was shown

TABLE 3—THE EFFECT OF RESIDUES OF THERAPEUTIC CHLORTETRACYCLINE IN MILK ON THE MULTIPLICATION OF STAPHYLOCOCCI

Holding Temp. (°C)	Staph. added (No./ml)	Staphylococci*: No./ml		
		Start	1 hr.	24 hr.
10	0	800	900	750
10	10^6	1,200,000	1,000,000	800,000
22–25	0	800	1,340	60,000,000
22–25	10^6	1,200,000	2,250,000	161,000,000
Raised to 35, kept at 22	0	800	1,050	64,000,000
Raised to 35, kept at 22	10^6	1,200,000	2,030,000	214,000,000

*Resistant to chlortetracycline.

sufficient to cause inhibition of a sensitive culture. At 10°C no multiplication could be demonstrated whether or not staphylococci had been added. At 22°C, and with no additions from external sources, the staphylococci multiplied from 800/ml to 60×10^6/ml in 21 hrs. Under the simulated natural conditions the corresponding figure was 64×10^6/ml. The comparative figures for preparations to which 10^6 staphylococci had been added were 161×10^6/ml and 214×10^6/ml, respectively.

Simulated cheese making: the effect of the holding temperature of milk, of antibiotics, and contamination with manure on the multiplication of staphylococci.

Table 4 expresses the data showing the enumeration of staphylococcus and lactic streptococci at different stages of cheese manufacture using milk held overnight at 10°C and 22°C, respectively, and to which had been added progressive levels of penicillin. The data illustrate the following findings: (1) staphylococcus did not multiply significantly at 10°C; (2) with amounts of

TABLE 4—SIMULATED CHEESE MANUFACTURE: THE EFFECT OF LOW CONCENTRATIONS OF PENICILLIN ON THE MULTIPLICATION OF STAPHYLOCOCCI AND LACTIC STREPTOCOCCI

Penicillin Conc. (I.U./ml)	Staphylococci and Lactic Streptococci (No./ml$\times10^6$)								
	Start		"Clot" Stage (2 hr. after starter added)		After "Scalding" at 40°C				Curd after overnight pressing
					Curd		Whey		
	Staph.	Strep.	Staph.	Strep.	Staph.	Strep.	Staph.	Strep.	Staph.
Milk Held Overnight at 10°C									
0	0.00026	<100	0.00027	2	0.064	157	0.020	50	
Milk Held Overnight at 22°C									
0	17.3	0.063	30	2.5	570	10.0	24.2	6.5	710
0.03	1.7	<100	5	2.3	116	7.5	10.7	28	52
0.05	0.75	<100	2.2	1.4	47	1.0	2.8	9.0	10
0.07	0.123	<100	0.180	2.8	8.4	12.5	0.28	20.0	3.3
0.09	0.061	<100	0.077	4.3	2.06	15.0	0.05	12.7	2.1

penicillin ranging from none to 0.05 I.U./ml, multiplication of staphylococci increased to a small multiple of the initial content up to the time of formation of the curd; (3) fastest multiplication of staphylococci occurred during formation of the "clot" and the completion of the scalding period. After the scalding stage, staphylococci were present in the curd in large numbers (up to 570×10^6/ml without penicillin, and to 116×10^6/ml in the presence of 0.03 I.U. of penicillin). (4) In the presence of such large numbers of staphylococci the numbers of lactic streptococci in the curd were reduced from a maximum of 157×10^6/ml (milk with low initial numbers of staphylococci and no penicillin) to 7.5×10^6/ml in the presence of 0.03 I.U. of penicillin, and 1×10^6 in the presence of 0.05 I.U. At this last concentration of penicillin, staphylococci in the curd numbered 47×10^6. At higher concentrations the numbers of staphylococci were less than that of the lactic streptococci.

In the absence of penicillin, but with high numbers of staphylococci (17.3×10^6) at the start of the process, staphylococci and streptococci were present in the curd in the respective numbers 570×10^6 and 10×10^6. With low initial numbers of staphylococci the respective numbers were 64,000 and 157×10^6. Hence, a high population of staphylococci appeared inhibitory to the lactic streptococci quite apart from any influence of penicillin. (5) No significant multiplication occurred in the curd during the pressing period; (6) numbers of staphylococci in the curd were several-fold greater than in the whey. The lactic culture showed no consistent relationship in this manner.

The total pH data from these experiments are not tabulated due to space considerations, but the pH of the foregoing specimens after curd-formation ranged from pH 5.35 to 5.8. The mean pH value of six replicates of cheese made with the same range of concentrations of penicillin under the same conditions did not differ from the mean of cheeses made without added penicillin. The curd made from milk with penicillin in amounts greater than 0.02 I.U./ml tended to be softer and more moist, and the whey cloudy as compared with the characteristic firm curd and clear whey from specimens without penicillin.

The data from the experiment to assess the influence of contamination of milk with manure on the response of staphylococcus to penicillin is summarized in table 5. These data show that (1) cooling of milk reduced the initial staphylococcus inoculum at the start of cheese manufacture; (2) with staphylococcal inoculum from external sources the final number of staphylococci recovered in the absence of manure bore a positive relationship to the numbers of staphylococci present in the milk at the start of the cheese-making process; (3) the levels of penicillin used in this experiment restricted the multiplication of staphylococci, and 0.5 I.U./ml caused an overall reduction in numbers of this organism; (4) manure had a variable effect on development of staphylococci: the numbers of specimens showing an increase or a decrease in staphylococci in the presence of manure were nearly equal, while several specimens showed no change; (5) the pH of the milk coagulum at time of clotting was more variable in the presence of contamination from manure, with a general tendency towards less acid conditions.

The data presented in this paper seem to warrant the following deductions: (1) milk stored at 10°C allows no growth of staphylococci in a 22-hour period; (2) milk stored at or near 22°C during overnight can allow the development of

TABLE 5—The Effect of Manure Contamination, Penicillin and the Holding Temperature of Milk on the pH of Curd and the Multiplication of Staphylococci During Simulated Cheese Manufacture

Treatment					Staphylococci: No./ml (X 10^6)							
			pH after scalding		Start		After 15 hr. holding		Clot Stage		Curd After scalding	
Staph. added No./ml	Pen. added (I.U./ml)	Holding temp. °C	Manure	No Manure	Manure	No Manure	Manure	No Manure	Manure	No Manure	Manure	No Manure
0	0	10	5.65	5.4	0.19	0.28	1.0	4.4	7.2	5.2	7.2	10.0
0	0	22	5.65	5.5	0.19	0.28	12.0	13.0	40.5	13.0	39.0	13.0
0	.05	10	5.7	5.5	0.12	0.10	0.14	0.1	0.28	0.08	3.8	3.25
0	.05	22	5.55	5.45	0.12	0.10	20.0	3.6	1.3	0.13	3.0	4.0
0	.5	10	5.75	5.95	0.05	0.05	0.006	0.003	0.004	0.001	0.019	0.017
0	.5	22	5.7	5.55	0.05	0.05	1.86	0.13	1.52	0.10	0.36	0.20
10^3	0	10	5.8	5.8	0.25	0.23	2.00	1.17	5.0	10.0	32.5	26.0
10^3	0	22	5.45	5.45	0.25	0.23	10.00	60.00	60.00	65.00	58.00	65.00
10^3	.05	10	5.6	5.8	0.16	0.14	0.14	0.16	0.15	0.21	5.00	4.2
10^3	.05	22	5.55	5.6	0.16	0.14	10.0	26.0	23.0	12.0	18.20	8.5
10^3	.5	10	5.85	6.4	0.005	0.08	0.005	0.008	0.002	0.002	0.09	0.02
10^3	.5	22	5.55	5.75	0.005	0.08	1.25	0.30	1.1	0.32	0.87	1.00
10^6	0	10	5.95	5.6	2.0	4.3	4.1	1.65	18.6	2.5	12.2	30.0
10^6	0	22	5.8	5.35	1.1	4.3	122.0	100.0	136.5	60.0	94.0	48.0
10^6	.05	10	5.8	5.5	1.20	1.65	1.01	0.60	0.84	0.70	0.61	1.04
10^6	.05	22	5.9	5.65	1.20	1.20	26.5	14.5	29.4	20.0	0.2	45.0
10^6	.5	10	5.7	6.05	1.10	1.30	0.81	0.6	0.52	0.30	<0.0001	0.05
10^6	.5	22		5.8	1.10	1.30	1.41	0.33	1.16	0.30	0.30	0.46

Staphylococcus to densities of several million per ml, this value bearing a positive relationship to the numbers of staphylococci initially present; (3) levels of penicillin in milk at or higher than 0.01 I.U./ml reduced the rate of multiplication of the penicillin-susceptible strains used in this experiment. A chlortetracycline-resistant strain multiplied at an unusually rapid rate in milk containing residues of CTC.

In a simulated manufacture of cheese, staphylococci multiplied rapidly after curd formation and during the "scalding" process. The numbers of staphylococci in the pressed curd bore a positive relationship to the numbers of staphylococci present in the milk at the start of the cheese-making process. This agrees with the findings of Takahaski and Johns[2]. In the absence of antibiotics, a high population of a specific strain of *Staphylococcus* was inhibitory to lactic streptococci.

The presence of low levels of penicillin in the milk tended to decrease the rate of multiplication of staphylococci during cheese making, but it was demonstrated that in the presence of penicillin at concentrations of from 0.01 to 0.05 I.U./ml the lactic streptococci were repressed to a greater degree than the staphylococci so that the ratio of staphylococci to lactic streptococci ranged to 15:1 (in the presence of 0.03 I.U. penicillin). Since the pH of curd made under these various conditions showed no consistent difference from that of control preparations, it is reasonable to consider that acid produced by staphylococci contributed to the characteristic pH change. Such conditions in commercial manufacture could prove dangerous, and, indeed may explain recent specific outbreaks of food-poisoning.

The presence of extraneous contamination of milk from a manure source did not modify the multiplication of staphylococci in predictable manner. Responses ranged from no effect, to a decreased or an increased rate compared with specimens free from such contamination. Such variability might well depend on the nature of the organisms from the manure that became biologically dominant in the milk, and would open to challenge any generalization that milk with a high standard plate count would not be conducive to multiplication of staphylococci[2].

The experiments reported herein simulate extreme fault. In practice the hazard would normally be reduced by dilution of staphylococci or of antibiotic from a severely contaminated source with milk of more hygienic quality. However, the data expressed in this report are in accord with data from specific specimens of commercial cheese-milk and cheese known to this laboratory and point strongly to two potential health hazards arising from consumption of cheese as presently made from unpasteurized milk. These are: (1) an enhanced risk of staphylococcal food-poisoning due to the following factors with effect either singly or collectively; (a) inadequate cooling of milk contaminated with staphylococci; (b) the presence of antibiotic residues in milk used for making cheese; (c) the presence of strains of staphylococci resistant to the antibiotics present in the milk. (2) If the present trend be established towards an increase of the proportion of staphylococci in milk that are of phage patterns identical with those known to have caused human infection[5], then faulty cheese manufacture will introduce into the community very large populations of such organisms. Three instances of the infection of cattle with the "hospital epidemic strain", 80/81, have been brought to our

attention recently. Any widespread introduction of this organism into the community through foods would seem undesirable.

Summary

Laboratory studies simulating cheese-making show that the following factors in relation to milk quality can contribute to the development of massive populations of staphylococci in cheese: substantial contamination with staphylococci originating from the bovine udder; inadequate overnight cooling; the presence of antibiotic residues; contamination with strains of staphylococci resistant to the antibiotics present in the milk.

Multiplication of staphylococci can occur rapidly during the period of heat treatment after coagulation of the casein. Staphylococci in excess of 500 million per gm have been demonstrated in the curd after application of specific combinations of the above conditions. The presence of low levels of penicillin in the milk was shown to allow selective multiplication of the staphylococci and inhibition of the lactic starter culture. The influence of other bacteria on the multiplication of staphylococci could be stimulatory, repressive or of no effect.

Two public health hazards are envisaged: staphylococcal food-poisoning, of which severe outbreaks have occurred recently, and the dissemination into the community of large populations of virulent strains of staphylococci.

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Résumé

Des études conduites en laboratoire, reproduisant les procédés de fabrication du fromage, démontrent que les conditions suivantes quant à la qualité du lait, peuvent contribuer au développement d'une trés grande population de staphylocoques dans le fromage: Une contamination sérieuse par les staphylocoques provenant du pis des vaches; un refroidissement insuffisant au cours de la nuit; la présence de résidu d'antibiotique; une contamination par des souches de staphylocoques non-sensibles aux antibiotiques présentes dans le lait.

Au cours de l'application de la chaleur, après la coagulation de la caséine, les staphylocoques peuvent se multiplier très rapidement. On a décelé la présence de plus de 500,000,000 de staphylocoques par gramme dans le caillé par suite de l'application de la combinaison des conditions énumérées plus haut. Il a été démontré que la présence de petites quantités de pénicilline dans le lait permet la multiplication sélective des staphylocoques et l'inhibition de la culture-mère de bacilles lactiques. L'influence d'autres bactéries sur la multiplication des staphylocoques pourrait être soit stimulante, soit répressive, soit nulle.

Deux dangers qui menacent la santé publique doivent être considérés: l'empoisonnement alimentaire dû aux staphylocoques dont des manifestations sérieuses ont été notées récemment, et la dissémination parmi la population de grandes quantités de souches virulentes de staphylocoques.

Air Pollution Activities in Ontario

C. M. JEPHCOTT, PH.D.[1]

AIR pollution as defined in The Air Pollution Control Act, 1958, means "the presence in the outdoor atmosphere of any air contaminant in quantities that may cause discomfort to or endanger the health or safety of persons, or that may cause injury or damage to property or to plant or animal life." Some air contaminants such as volcanic ash, dust, plant pollens and some forms of radioactivity, occur naturally but air pollution control is directed, mainly, to the regulation of emissions from man-made activities.

Smoke and fly ash produced by burning various types of fuel have always been important causes of air pollution. In England, complaints concerning smoke date back to the 13th century. A proclamation issued in the reign of Edward I, banning the use of coal in London while Parliament was sitting, is the first known air pollution control act. In 1661, John Evelyn in his book entitled "Fumifugium" advised Charles II how to rid London of its smoky fog. In the United States, the first smoke control ordinance was passed in 1881 by the City of Chicago, although private litigation with respect to the emission of smoke occurred in St. Louis as early as 1864. The first smoke abatement by-law in Ontario was passed by the City of Toronto in 1907, and this was enforced as shown by the imposition of a fine of $50.00 against an offender in the following year.

Recent events, such as the Donora incident in 1945, when twenty deaths were attributed directly to air pollution, caused a rapid increase of air pollution control legislation at both the state and municipal levels in the United States. In Great Britain, after the London episode in December, 1952, when 4,000 deaths were caused by smog, public opinion was sufficiently aroused to ensure the acceptance of the recommendations of the Beaver Committee and the passing of the Clean Air Act 1956. For several generations, numerous government committees in England had made recommendations for the control of air pollution but this was the first time that any action had been taken. These events could not help but leave their impact on the citizens of Ontario. The economy which at one time was predominantly agricultural is now mainly industrial. This change is accelerating and the pollution problems will keep pace with this expansion.

It may be pointed out that some sources of air pollution cannot be controlled on a provincial or municipal level. The control of the emission of smoke from railway locomotives comes under the jurisdiction of the Dominion Government and the regulation of such emissions comes under the authority of the Board of Transport Commissioners for Canada. General Order No. 18, issued by the Board on November 25, 1908, came into force January 1,

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1909. It forbade the unnecessary and unreasonable emission of dense smoke from steam locomotives in an Ontario municipality which had a local air pollution control by-law. General Order No. 18 was rescinded, and on April 1, 1959, was replaced by General Order No. 838, which was made applicable to all of Canada. In addition to steam locomotives, this Order provides for the control of emissions from diesel locomotives and incinerators and open fires on railway property.

Legislation in Ontario

To obtain firsthand information on the air pollution problem in the province, the Ontario Government appointed a Select Committee on Air Pollution and Smoke Control in March, 1955, with the following terms of reference:

> "That a Select Committee of the House be appointed to examine existing legislation and practice in relation to smoke control and air pollution in Ontario with particular reference to the installation and maintenance of equipment to control smoke and air pollution and methods and ways of extending public information in connection therewith."

The Committee visited 42 municipalities of which 28 were in Ontario, and took evidence from several hundred witnesses. An interim report dated February 29, 1956, was presented to the Ontario Legislature on March 15, 1956, and the final report, dated February 14, 1957, giving the findings and recommendations was submitted during the 1957 session.

Air pollution control by-laws had been passed in many Ontario municipalities under the enabling legislation contained in The Municipal Act. Prior to 1958, only Metropolitan Toronto, Hamilton and Windsor employed full-time personnel to administer and enforce their by-laws. The first two maintain well equipped laboratories for the determination of air pollution levels. In Windsor, much of the work had been done by the International Joint Commission as part of their air pollution investigation in the Windsor-Detroit area.

The Air Pollution Control Act, 1958, came into force on May 21, 1958 and, on the same day, the sections of The Municipal Act dealing with air pollution were repealed. By-laws written under this authority were not invalidated. For purpose of clarification and ease of administration, the Air Pollution Control Act was amended in 1959. The enabling section of the Act gives very wide powers to the municipalities as it permits them to pass by-laws to regulate the emission of any air contaminant from any source, with the main exemption applying to private residences.

To administer the Act, an Air Pollution Control Branch had been established in the Department of Health in July 1957. The Act empowers the Department to engage consultants, make grants to universities for research in the field of air pollution and assist municipalities in the preparation of air pollution control by-laws, in the development of an air pollution control program and in the training of local staff. The Department may furnish advice, initiate investigations and recommend standard procedures.

Air Pollution Investigations in Ontario

In the opinion of the Councils of Windsor and Detroit, air pollution could not be controlled "effectively" in their cities as long as vessels plying the

Detroit River were permitted to emit an unlimited amount of smoke. This was an international problem, and the matter was referred to the International Joint Commission in 1949. The Commission appointed a Technical Advisory Board on Air Pollution with equal representation from Canada and the United States. At present the personnel of the Canadian Section of the Board is drawn from the Department of National Health and Welfare, and the Ontario Department of Health. The Board planned and arranged for the carrying out of an investigation into the sources of pollution from industrial and public activities, concentration levels, type of air contaminants, transboundary flow of pollution and the effects on public health, vegetation and property. A final report on this study was presented to the Commission in 1958.

In Sarnia, in October 1952, three petro-chemical industries and the Ontario Government agreed to share the cost of an air pollution survey. This work is still in progress and from its inception has been done by the Ontario Research Foundation. At present, ten companies are contributing funds and the work has led to the voluntary introduction of controls by industry and increased co-operation to lessen the air pollution level in the area.

In the fall of 1957, the extent of contamination of the air from diesel powered locomotives in the Sarnia-Port Huron railway tunnel was determined by staff members of the Occupational Health Division of the Department of National Health and Welfare and of the Research and Development Division of the Canadian National Railways. No abnormal health symptoms were observed in participants during the eight-hour exposures to the tunnel atmosphere, with the exception of some minor cases of eye and throat irritation on three brief occasions. Nevertheless, adequate forced draft ventilation was recommended and was installed prior to the replacement of electrical operation of trains by diesels.

In Hamilton, the local branch of the Canadian Manufacturers' Association sponsored a three-year air pollution survey. This was done by the Ontario Research Foundation from 1955 to 1958. It included dustfall measurements, the concentration of air-borne particulate matter, the sulphur dioxide and hydrogen sulphide levels and a study of the micrometeorology of the area. The final report was presented in March 1959.

A newcomer in the air pollution survey field is the Ontario Hydro-Electric Power Commission. Air pollution levels are being determined in the vicinity of the Richard L. Hearn steam power plant in Toronto, and in the area adjacent to the steam power plant being constructed at Lakeview. This latter investigation will furnish information on the pollution levels in the district prior to the operation of the plant.

At present, pre-operational environmental surveys are being conducted in the vicinity of nuclear power plants now under construction to determine the existing radiation levels. These surveys will be continued after the plants are completed to assess the amount of radiation in the area produced by these nuclear power plants.

A reactor is being built by the Power Reactor Development Corporation at Lagoona Beach on Lake Erie some 30 miles south of Detroit. Hydrological and meteorological studies are being done as well as an estimation of the normal radiation levels. The survey area extends some 30 miles from the

plant site and thus extends for a short distance into southwestern Ontario. For this reason, the co-operation of the Federal and Provincial Departments of Health was requested.

Work on the survey on the Nuclear Power Demonstration Plant No. 2 site and surrounding area began in November 1958. This plant is being built near Rolphston on the Ottawa River about 150 miles upstream from Ottawa and is scheduled for completion in the fall of 1961. The survey extends over an area of several hundred square miles and is being done by Atomic Energy of Canada Limited. It is probable that a similar investigation will be made in the vicinity of the proposed Canadian Deuterium Uranium Plant on Lake Huron.

Mention should be made of the work being done under The Damage by Fumes Arbitration Act. This Act empowers the arbitrator, appointed by the Ontario Department of Mines, to assess the damage occasioned directly or indirectly to crops, trees or other vegetation by sulphur fumes arising from the smelting or roasting of nickel-copper ore and iron ore or from the treatment of sulphides for the production of sulphur or sulphuric acid and to assess the amount of damage and make an award. For some years, continuous recordings of the amount of sulphur dioxide in the air have been taken during the crop season at several test stations in the Sudbury area. Recently, this work has been extended to include the determination of sulphur dioxide levels at Cutler and Jamestown.

For the past few years, the presence of fleck on the leaves of tobacco plants has caused a loss of many millions of dollars to the farmers in the Delhi-Simcoe area. This disease is thought to be caused by ozone but there might be other contributing factors. This subject has been under active investigation by a group of scientists from the Ontario Research Foundation, the Federal Department of Agriculture and the Meteorological Branch of the Department of Transport to determine the causative agent.

During the past two crop seasons, personnel from the Ontario Departments of Health, Mines and Agriculture have investigated the problem of damage to oats and corn in Humberstone Township alleged to be due to air pollution. Evidence pointed to the emission from the stack of a nearby industry as being the cause of the crop injury. Measures are being taken to reduce the amount of emission from this stack.

An air pollution survey is being made by the Air Pollution Control Board of the State of New York in Erie and Niagara Counties which lie along the Niagara River. As air contaminants in this area are blown across the international boundary, it was realized that the survey should be on a regional basis and include communities on both sides of the river. The survey on the Canadian side is being done by the Ontario Department of Health and the area under study embraces the municipalities in the Townships of Niagara, Stamford, Willoughby, and Bertie. Data have been collected on the quantity of the different kinds of air contaminants being emitted to the outdoor atmosphere and air pollution levels in the area are being determined at 6 sampling sites. This air sampling will be continued for at least a year so as to obtain a knowledge of the seasonal variations.

An interesting development and one which bodes well for air pollution

control is the enlightened attitude of some of the new industries in Ontario. Several have undertaken plant site air pollution surveys before and after the construction of their plants. It is hoped that this practice will become more prevalent in the future.

Summary

In 1955, the Ontario Government appointed a Select Committee of the House to examine existing legislation and practice in relation to smoke control and air pollution in Ontario. The final report of the Committee containing their recommendations was presented to the legislature in 1957 and, in the following year, the Air Pollution Control Act was passed. An Air Pollution Control Branch was established in the Department of Health to administer the Act.

A list of air pollution investigations in Ontario is given. These include the following: (1) surveys in Windsor and Hamilton which have been completed recently, (2) current surveys in Sarnia and Niagara Falls, (3) determination of radiation levels in the vicinity of nuclear power plant sites on Lake Erie and the Ottawa River, (4) evaluation of air pollution levels near steam power plants in Toronto and Lakeview, (5) investigation into crop damage considered to be due to air pollution in the Sudbury, Delhi and Port Colborne areas.

Résumé

En 1955, le Gouvernement de la Province de l'Ontario créait au sein de l'Assemblée législative un comité spécial chargé d'inventorier l'arsenal législatif et administratif en Ontario, relatif à la prévention de la fumée et à la pollution atmosphérique. Un rapport complet contenant les recommandations de ce comité fut présenté à la Législature en 1957 et l'année suivante une loi régissant le contrôle de la pollution de l'air était adoptée. On a confié au Service de Santé le soin d'appliquer cette loi et une nouvelle division y fut créée à cet effet sous le nom de "Division du Contrôle de la Pollution de l'Air."

Une liste de rapports techniques sur la pollution de l'air en Ontario est présentée. Cette liste comprend (1) une étude récemment complétée de la situation dans les villes de Windsor et de Hamilton, (2) des études en cours menées dans les villes de Sarnia et de Niagara Falls, (3) une évaluation du degré de la radioactivité dans les environs des centrales nucléaires situées sur le lac Erié et sur la rivière Outaouais, (4) une évaluation du degré de pollution dans le voisinage de centrales thermiques à vapeur dans les villes de Toronto et de Lakeview, (5) une enquête sur les dommages causés aux récoltes et imputés à la pollution de l'air dans les régions de Sudbury, de Delhi et de Port Colborne. (*Trad.: A. Guérard, I.P.*)

Canadian Journal of Public Health

THE NEW CHARTER OF THE ASSOCIATION

IN 1912 the newly appointed officers of the Canadian Public Health Association presented to Parliament a statement of its organization and its proposed work in the advancement of the health of all the people of Canada. It proposed that by the dissemination of the knowledge of the essential requirements of health, both personal and communal, much sickness and disability and many premature deaths could be prevented. The fifty years that have passed in the Association's history have given evidence of the vision and wisdom of the founders of the Association. The original charter, however, was not broad enough to permit the Association to move forward with its plans for the services which the Association must now provide if it is to continue to fulfil its functions. The Executive Council recognized this and appointed a committee with Dr. Kenneth Charron as chairman, to consider the charter. The Charter Committee sought the opinions of all members of the Executive Council and the provisions of the new charter represent the deliberations of the Committee over a period of two years.

The Committee was most fortunate in having the Honorary Solicitor of the Association, Mr. R. E. Curran, Q.C., as adviser. A Private Bill amending the charter was prepared by Mr. Curran and presented to Parliament at the present session. The Bill, S-9, was sponsored in the Senate by Senator Harold Connolly who was acquainted with the work of the Association during his term of office in Nova Scotia as minister of public health. The Bill was passed in the Senate on February 16. It was introduced in the House of Commons on February 26 by Dr. J. W. Kucherepa, Member of Parliament for Toronto High Park. It was generously supported by the Hon. Paul Martin (Essex East) and Mr. H. W. Herridge (Kootenay West). The addresses of these members of Parliament in support of the Bill, as contained in the official report of the House of Commons debates (Number 32), expressed high confidence in the Association and appreciation of its work during the fifty years of the Association's life. Dr. Kucherepa, who has had many years of experience in urban health department programs, reviewed the need of the Association for wider powers and expressed the hope that the Association might assist in the better co-ordination of professional and voluntary health efforts in Canada.

The Hon. Mr. Paul Martin paid tribute to the Association stating that everyone in this country owes a great debt to the Canadian Public Health

Association, and that this charter would permit the Association to enlarge its usefulness. Mr. H. W. Herridge (Kootenay West) gave wholehearted support to the Bill noting that changing concepts of public health were clearly indicated in the changes proposed in this measure, contrasting the undertakings of 1912 with the present day public health movement. The Bill was passed on March 20 and received Royal Assent on March 31. Members of the Association may well be proud of the status of the Association in public life in Canada.

To Dr. Charron, Dr. G. D. W. Cameron and Dr. G. E. Wride the Association is deeply indebted for representing the Association in the Parliamentary hearings.

The amended charter provides the Association with the authority to enlarge its program as visualized by the Committee on the Needs of the Association. The preparation and presentation of the new charter, entailing many months of work, is ample evidence of the determination and enthusiasm of our Association's leaders to make the Association a highly effective health promoting agency, serving the whole of Canada.

1960 NATIONAL HEALTH GRANTS PROGRAM

IT was a memorable meeting of the Canadian Public Health Association in Vancouver in May 1948 when the Honourable Paul Martin, as Minister of National Health and Welfare, announced to the members the National Health Grants Program of the Federal Government. In Mr. Martin's words on that occasion: "A new era has opened for public health in Canada." The eight grants which were announced provided in the first year $17,000,000 and $13,000,000 was provided for hospital construction.

The experience of the past decade has shown the wisdom of these annual health grants. In this relatively short period the program of aid to the provinces and through the provinces to local authorities for health work has become an integral part of the planning and financing of forward-looking health projects. It has made possible the training of public health personnel and the advancement of public health research.

The total annual allocation of the Health Grants' monies is now over $54,949,000, with an additional sum as a revote of monies for uncompleted hospital construction projects and includes the amount of $17,367,320 available each year for hospital construction. For the present year, substantial increases have been made in the mental health, the professional training, and the public health research grants. Decreases in several grants have been occasioned by the lower incidence of the diseases concerned or support now being included within hospital insurance programs. A summary of these changes is presented in this issue and the distribution by provinces of the various health grants for the present fiscal year of the Federal Government.

These changes reflect the careful and continuous study which is being made of the grants by the officers of the Department of National Health and Welfare under the Honourable J. Waldo Monteith, Minister of National Health and Welfare with the co-operation of the provincial departments of health in the endeavour to make the most effective use of this federal assistance in health work.

Changes in the National Health Grants

The Journal is indebted to Dr. G. E. Wride, Principal Medical Officer, Health Grants, Department of National Health and Welfare, for making possible the publication in this issue of an outline of the changes in the National Health Grants which were recently announced.

UNDER the provisions of Order-in-Council P.C. 1960-18/257, of March 3rd, 1960, a number of changes have been made constituting a moderate rearrangement of federal funds available to the provinces through the National Health Grants administered by the Department of National Health and Welfare. Grants are made also to the Northwest Territories and to the Yukon. The most outstanding of these changes are as follows:

General Public Health Grant: In view of the increasing prominence given to local public health services within the provinces, this Grant has been increased by almost $5,500,000. At the same time, the Laboratory and Radiological Services Grant, which has, to a large extent, been superseded by provisions of the Hospital Insurance plans, and the *Venereal Disease Control Grant*, which concerned problems of generally decreasing magnitude, have been discontinued and residual projects under both are being absorbed into the enlarged General Public Health Grant. *The Medical Rehabilitation and Crippled Children Grant*: These two prior Grants have now been merged and the total allocation increased by more than $1,000,000. This is to allow greater flexibility in developing programs and to avoid any artificial separation between the care provided for adults and that provided for children in the field of medical rehabilitation.

Other changes involve substantial increases in the *Mental Health*, the *Professional Training* and the *Public Health Research Grants*, with decreases in the *Tuberculosis Control Grant* due largely to the recognition of the declining use of tuberculosis sanatoria and the lower incidence of this disease; and, in the *Cancer Control Grant*, where portions of the programs previously supported by this Grant are now being included within the Hospital Insurance programs. A moderate reduction in the *Child and Maternal Health Grant* reflects a tendency to include projects common to both fields under the enlarged Public Health Grant. It should be noted that the total allocation of the Health Grants' monies remains at approximately the same level.

DISTRIBUTION OF GENERAL HEALTH GRANTS FOR THE FISCAL YEAR 1960-61

Prov.	Hospital Construction (a)	OTHER HEALTH GRANTS								Total Allotments (b)
		Professional Training	Mental Health	Tuberculosis Control	General Public Health	Cancer Control	Medical Rehabilitation and Crippled Children	Child and Maternal Health	Total	
Nfld.	1,401,919	52,240	243,993	164,678	395,900	97,439	74,914	71,576	1,100,740	2,502,659
P.E.I.	235,690	19,596	74,749	29,557	128,579	29,864	24,747	20,209	327,301	562,991
N.S.	2,033,443	77,358	374,218	146,292	601,591	149,434	113,515	77,046	1,539,454	3,572,897
N.B.	1,411,662	65,505	312,763	122,527	504,523	124,897	95,299	76,533	1,302,047	2,713,709
Que.	4,971,858	480,284	2,463,183	1,275,068	3,901,120	983,509	732,727	569,945	10,405,836	15,377,694
Ont.	9,575,956	569,938	2,927,993	904,242	4,635,290	1,169,096	870,507	486,501	11,563,567	21,139,523
Man.	1,285,813	93,257	456,645	180,662	731,784	182,345	137,948	89,597	1,872,238	3,158,051
Sask.	1,857,967	94,856	464,936	151,035	744,881	185,656	140,406	93,276	1,875,046	3,733,013
Alta.	1,361,175	126,936	631,253	210,975	1,007,580	252,063	189,706	126,413	2,544,926	3,906,101
B.C.	1,669,604	157,699	790,742	305,112	1,259,493	315,743	236,982	132,167	3,197,938	4,867,542
N.W.T.	132,336	4,034	15,389	6,085	26,472	6,148	5,095	4,161	67,384	199,720
Yukon	72,127	2,497	9,527	3,767	16,387	3,806	3,154	2,576	41,714	113,841
ALL	26,009,550	1,744,200	8,765,391	3,500,000	13,953,600	3,500,000	2,625,000	1,750,000	35,838,191	61,847,741

(a) Includes the following revotes: Revote for new projects $8,345,261; First Five Year Program—$296,969
(b) Does not include Public Health Research Grant unallotted by Province—$1,744,200
March 2, 1960. Source: Joint Administrative Unit.

The Canadian Public Health Association Annual Report

PART I

1959-1960

REPORT OF THE HONORARY SECRETARY

G. W. O. Moss, M.D., D.P.H.

AT THE MEETING of the Executive Council in Montreal in 1959 decisions were made which were of major significance for the future of the Association. Appropriately, the 1959 meeting marked the beginning of the fiftieth year of the Canadian Public Health Association and of the Canadian Journal of Public Health. The decisions made have required that the officers and various committees devote themselves to their work with increased emphasis and, in turn, will command the serious attention of the members of the Executive Council at this year's meeting in Halifax.

Foremost was the decision of the Executive Council to recommend to the membership that the charter of the Association be revised. This recommendation was approved at the general business meeting. Inasmuch as the Association's national charter was an Act of the Parliament of Canada passed in 1912, a revision of the charter necessitated that steps be taken to petition for an amendment to the Act establishing the Canadian Public Health Association through the introduction of a Private Bill in the Senate of Canada.

The Association owes a great debt to a number of persons for assistance voluntarily given in this cause. The Honourable Harold Connolly, member of the Senate of Canada from Halifax North, sponsored the Bill on our behalf in the Senate. Dr. J. W. Kucherepa, Member of Parliament for Toronto High Park, sponsored the corresponding Bill in the House of Commons. The Association has cause to be proud of its stature in Canada as one reads the unanimously favourable comments in the discussion of the Private Bill as recorded in the transcription of the proceedings. The Honourable Paul Martin, for many years Minister of National Health and Welfare, reviewed the work of the Association, emphasizing its great contribution to Canada and Mr. H. W. Herridge, Member of Parliament from Kootenay West, commended the Association for its services in public health.

Dr. K. C. Charron, Ottawa, Chairman of the Charter Committee, Dr. J. S. Robertson, Halifax, President of the Association, and the Honorary Secretary all found themselves deeply involved in this important work. The Committee is deeply indebted to Mr. R. E. Curran, Q.C., Honorary Solicitor of the Association, who prepared the Bill and whose advice and direction in its presentation were invaluable.

The Bill received unanimous support in both the Senate and the House of Commons and received Royal Assent on March 31, 1960. The Executive

Council in Halifax will therefore be presented with a new charter, An Act Respecting the Canadian Public Health Association, 1960. This is only a beginning. With the extended powers available in the new Act, a revision of the by-laws of the Association is imminent. This will require much study and thought on the part of Dr. K. C. Charron and his Charter and By-laws Committee. In this work Mr. R. E. Curran and his associate, Mr. J. D. McCarthy, are rendering invaluable service.

His Excellency Major General Georges P. Vanier, D.S.O., M.C., C.D., Governor-General of Canada, graciously bestowed his patronage upon the Association shortly after his assumption of office. The officers and membership are sincerely appreciative of this honour.

One of the highlights of the 1958 Executive Council meeting in Vancouver was the adoption of a report prepared by a committee under the chairmanship of Dr. Charron which dealt with the needs of the Association. A revision of the charter was one recommendation made in the report and we have seen the fulfilment of that recommendation. There were other important recommendations made, one of which dealt with the appointment of a permanent (salaried) executive officer. At the 1959 meeting in Montreal, an Action Committee to find ways and means of implementing the report of the Committee on Needs was formed. Dr. F. B. Roth, Regina, President-elect of the Association has been chairman of this committee. Important recommendations will be presented by this committee. Details of the work of various standing committees are described in this Annual Report. Representatives of certain special committees will report directly to the Executive Council.

A Fourth Revision of the Report on Salaries and Qualifications of Public Health Personnel is to be presented to the Executive Council at Halifax. Dr. L. A. Clarke, Hamilton, is chairman of this committee. Dr. Mosley and Dr. Moss assisted him in the preparation of the preliminary review of data presented for committee consideration. The original report was published in 1947, with revisions being made in 1949, 1952 and 1957. Special mention should be made of the contribution of Mrs. Olive Munro of the national office staff in the collection and compilation of the data.

An outstanding event of 1959 was the Jubilee Meeting in Montreal. The great success of the Jubilee Meeting was due to the leadership and enthusiasm of Dr. Jules Gilbert who, as President, not only contributed his best but enlisted the participation of a large group of public health leaders in Montreal. The program was in keeping with the anniversary occasion. Simultaneous translation of the addresses of the general sessions made possible the appreciation of all the papers. The Ministry of Health of the Province of Quebec and the Department of Health of Montreal participated in the program and arranged with the Province and the City for most generous hospitality. Dr. Cyrille Pomerleau of La Société d'hygiène et de médecine préventive de la Province de Québec shared the responsibility of the meeting with Dr. Gilbert.

The major responsibilities for an annual meeting rest with the provincial organization of the Association which sponsors the meeting. The Nova Scotia Branch, and in particular, those of its members who have spent much time and effort in planning for the varied activities of this year's convention merit the warmest thanks for this outstanding congress of public health leaders.

Dr. J. S. Robertson, President of the Association, has directed the activities concerned with the annual meeting. For many years he has given generously of his time and energy to the Association. Seldom has he been absent from a meeting of the Executive Council over the last decade. Through the kind and generous support of its Honorary President, the Honourable R. A. Donahoe, Q.C., Minister of Public Health and Welfare and Registrar-General, Province of Nova Scotia, Dr. Robertson has been able to visit most of the provincial public health organizations, visiting the Ontario association in the fall and the four western organizations during Easter week. It is hoped that such visits will be made in coming years by future presidents. One of the serious difficulties with a national organization in a country of our size is maintaining personal contact among the officers of the national and provincial bodies other than at the time of the national annual meeting, and the situation is not made any easier when it is realized that all officers serve in an honorary capacity and Association travel funds are very limited. Dr. Robertson has been able to preside at two of the three meetings of the Executive Committee held in the national office since the last annual meeting. The Association has profited immeasurably from his interest and activity.

Future annual meetings have already received attention. The 1961 meeting will be held in conjunction with the Saskatchewan Branch with convention headquarters at the Saskatchewan Hotel, Regina, during June 5, 6 and 7. The 1962 meeting will be held jointly with the Ontario Public Health Association in Toronto at the Sheraton King Edward Hotel during the week of May 28.

The Provincial Government of Ontario established a Fluoridation Investigating Committee by order-in-council to inquire into, examine and report upon all matters in any way pertaining to fluoridation of public water supplies. This committee is holding public hearings and will make recommendations to the Ontario Government respecting fluoridation. The Association is cognizant of the importance of these hearings and has made representations. The Honorary Secretary has submitted a statement to the Committee outlining the Association's stand. Dr. F. H. Compton, Director of Dental Health, City of Toronto, and Dr. L. A. Pequegnat joined in the preparation of the statement.

The officers wish to convey to the national office staff a very sincere expression of appreciation for their efficient service. Only those officers who are in close contact with the national office can fully realize the importance of our staff and the reliance that is placed upon them. All of the officers of the the Association serve in an honorary capacity without remuneration, and of necessity because of heavy professional responsibilities must rely on the office staff very heavily. There has been no change in the assignments carried out by the three full-time personnel. Mrs. Cynthia Palmer, B.A. acts as editorial assistant and assistant secretary. Mrs. Ruth Wolkoff is responsible for a considerable measure of the stenography and bookkeeping as well as the correspondence course for sanitary inspectors. Mrs. Olive Munro assists with the Journal, membership and subscription rolls, and has contributed to the work of the committee on salaries and qualifications of public health personnel.

REPORT OF THE HONORARY TREASURER

William Mosley, M.D., D.P.H.

THE HONORARY TREASURER is pleased to report some improvement in the financial position of the Association during the past year. This is due to increased support from the federal and provincial departments of health and the generous participation of several companies in the program of the Association through enrolment as Sustaining Members. The following six companies have been enrolled as Sustaining Members: Canadian Industries Limited; Canadian Kodak Co., Limited; Goodyear Tire & Rubber Company of Canada, Limited; Hudson's Bay Company; International Nickel Company of Canada, Limited; and Merck & Co. Limited. The T. Eaton Co. Limited in lieu of enrolling as a Sustaining Member provided a grant in the amount of $200.00.

The raising of membership fees in the national body from $2.00 to $5.00 resulted in an increase in membership revenue of $3,454.75 over 1958. The fee for individual subscriptions, in Canada, to the Canadian Journal of Public Health was increased from $3.00 to $5.00 which resulted in an increased revenue of $1,039.77 over 1958. The revenue from advertising in the Canadian Journal of Public Health increased by $2,168.51 during 1959, chiefly because of a special effort to increase the advertising in the Jubilee issue in September.

The operating costs of the Association increased by $7,124.52 over 1958, including an increased cost of printing the Journal of $2,715.76. The appointment from part-time to full-time service of the third member of the office staff occasioned an increase of $1,959.26 in the provision of salaries. The Jubilee Meeting in Montreal occasioned a net expenditure to the Association of $949.36. The Christmas Laboratory Section meeting contributed a surplus of $578.95.

The increased revenue from membership, subscription fees, and advertising did not compensate for the increased operating costs and had it not been for the acceptance of substantially increased accounts for services rendered by the Association, approximately double in amount, and the enrolment of Sustaining Members, the Association would have shown a deficit of several thousand dollars.

Gratifying as this modest surplus is, the Association will require increased financial support to permit the implementation of any of the recommendations of the Action Committee. The present small surplus is barely sufficient to provide for the normal increased operating expenses.

As Honorary Treasurer, I would remind Council of the fact that the work of the Association is steadily increasing. Direction of the Association's activities is given generously by honorary officers. It is gratifying that the Action Committee is very conscious of the need of the Association for an executive director whose services would be supplemented by the Honorary Secretary, Honorary Treasurer and other members. Members of the Association and the Action Committee may see from the financial statement that it will be absolutely imperative to increase the revenues in order that the Association may during the next few years embark upon the expanded program now being planned.

CANADIAN PUBLIC HEALTH ASSOCIATION
BALANCE SHEET
AS AT 31ST DECEMBER, 1959

ASSETS

Cash on hand		$ 30.00	
Cash in bank—Current	$ 6,915.47		
—Savings	16,020.34	22,935.81	
Accounts Receivable	$ 2,182.03		
Less: Allowance for Bad Debts	35.00	2,147.03	
British Columbia Public Health Advance		100.00	
Deposit with Postmaster		25.00	$25,237.84
Investments—Province of Ontario Bonds 4%—1961			5,000.00
Canadian Journal of Public Health		$ 1,000.00	
Office Equipment	$ 3,155.03		
Less: Accumulated Depreciation	2,025.03	1,130.00	2,130.00
Prepaid Expenses			878.20
			$33,246.04

LIABILITIES

Accounts Payable			$ 4,314.59
Prepaid Subscriptions			444.00
Surplus			
Balance as at 31st December, 1958		$23,217.91	
Add			
Excess of Revenue over Expenditure for the Year		5,269.54	
Balance as at 31st December, 1959			28,487.45
			$33,246.04

Submitted with our report of this date attached.

TESKEY, PETRIE & BURNSIDE,
Chartered Accountants.

TORONTO, Ontario,
23rd March, 1960.

CANADIAN PUBLIC HEALTH ASSOCIATION
COMPARATIVE BALANCE SHEET

ASSETS

	31st Dec. 1959	*31st Dec. 1958*	*Increase*	*Decrease*	*Net Plus or Minus*
Cash on hand	$ 30.00	$ 30.00	—	—	
Cash in Current Account	6,915.47	3,542.64	$3,372.83		
Cash in Savings Account	16,020.34	14,343.99	1,676.35		
Accounts Receivable Less Allowance	2,147.03	1,140.97	1,006.06		
B.C. Public Health	100.00	100.00	—	—	
Postmaster	25.00	20.00	5.00	—	
Investments	5,000.00	5,000.00	—	—	
Canadian Journal of Public Health	1,000.00	1,000.00	—	—	
Office Equipment Less Depreciation	1,130.00	—	1,130.00	—	
Prepaid Expenses	878.20	411.86	466.34	—	
	$33,246.04	$25,589.46	$ 7,656.58	—	$ 7,656.58

LIABILITIES

Accounts Payable	$ 4,314.59	$ 1,667.55	$ 2,647.04		
Prepaid Subscriptions	444.00	704.00		260.00	$ 2,387.04
As Per Revenue and Expenditure Account					$ 5,269.54

Schedule A

CANADIAN PUBLIC HEALTH ASSOCIATION
REVENUE AND EXPENDITURE ACCOUNT
FOR THE YEAR ENDED 31ST DECEMBER, 1959

EXPENDITURE

Printing	$21,863.98
Postage on Magazines and Mailing Cost	787.03
Honoraria	120.00
Salaries	9,293.77
Travelling	53.92
Stationery and Office Supplies	361.91
Postage, Telephone and Express	643.55
Unemployment Insurance	83.63
Commissions Paid	920.26
Annual Meeting	1,638.53
Laboratory Section	766.60
Sanitary Inspectors'—Examinations	173.21
—Manuals	129.35
—Correspondence Course	334.35
Reprints	970.44
Federal and Provincial Health Services	545.79
Salary Survey	51.69
Committee on Membership	65.09
Miscellaneous Expenses	862.48
Provision for Depreciation:	
Office Furniture and Equipment	65.00
Bad Debts Written off	8.50
Discounts and Exchange	254.85
	$39,993.93
Excess of Revenue over Expenditure for the Year transferred to Surplus Account	5,269.54
	$45,263.47

REVENUE

Advertising		$ 9,197.05
Subscriptions—less Refunds		3,997.61
Membership		7,072.75
Sustaining Members		1,400.00
Fees for Services Rendered—		
Dominion of Canada	$ 7,500.00	
Province of Ontario	2,500.00	
Province of Quebec	2,400.00	
Province of British Columbia	1,000.00	
Province of New Brunswick	1,200.00	
Province of Manitoba	700.00	
Province of Saskatchewan	1,500.00	
Province of Nova Scotia	1,200.00	
Province of Prince Edward Island	200.00	
Province of Newfoundland	200.00	
Alberta Division—C.P.H.A.	500.00	18,900.00
Annual Meeting		477.59
Laboratory Section		1,345.55
Sanitary Inspectors'—Examinations		595.00
—Manuals		56.00
—Correspondence Course		756.00
Reprints		989.57
Interest on Investments		200.00
Interest on Savings Bank Account		276.35
		$45,263.47

Association News

Saskatchewan Branch

Dr. Hugh Robertson, Director of the Provincial Laboratory, was elected president of the Saskatchewan Branch at its annual meeting held April 19 and 20 in Regina. Other members of the executive elected to office were: Honorable J. Walter Erb, honorary president; Louise Miner, past president, Dr. Alexander Robertson, vice-president; E. L. Abbott, secretary-treasurer; and Dr. M. S. Acker, Stanley Frew, Ed. Anaka, Dr. Matthew Dantow, E. D. Donaldson, William Kempa, J. A. Mahon, Muriel Niblett, Stanley Rands, Dr. Elizabeth Ives, Orpha Yonge, and Jean Whiteford as members-at-large.

The Branch annual meeting was the most enthusiastic since its inception. There were 279 registrations. Highlighting the program were a symposium on today's most urgent public health problems chaired by Dr. V. L. Matthews and a panel, moderated by Dr. A. Robertson and led by Dr. Harold Baker, entitled "A Rural Community Looks At Its Health Needs". Miss K. E. Taggart gave a fine address, "Developments in Provincial Welfare Services" and Mr. Jack Wilkie presented "Fitness and the Average Man—Whose Responsibility?".

The participants in the symposium, Mr. Stanley Rands, Dr. Arnold Lowden, Miss Lola Wilson and Dr. A. F. Huston, prepared papers which were distributed several days in advance to all those who were likely to attend the annual meeting. This meant that the participants did not need to read their papers but were free to use their time in discussing the content. Due to this innovation the discussants, Dr. T. J. Orford, Dr. Allan Roeher, Miss Caroline Dauk and Mr. J. A. Mahon, and the audience, were able to join more fully and more intelligently in the discussion.

The panel "A Rural Community Looks at Its Health Needs" consisted of Mrs. Jean Pisak, Mrs. Zelta Persson, Mr. A. D. MacKenzie, Miss Joyce Fast, Mr. S. A. Dyminiw and Dr. Eric Chapman, all of Esterhazy, Sask. They were ably assisted in the preparation of their material by Dr. Harold Baker from the Centre for Community Studies, University of Saskatchewan. Dr. Baker has been assisting the community of Esterhazy for some time in a study of the many problems which confront it in this era of rapid changes and development.

The significance of this group of citizens at the annual meeting of the association is the recognition that public health needs the active participation of the community if it is to be successful. Public health has long since passed the authoritarian stage. This panel demonstrated that citizen partnership with health agencies in meeting health needs can be very worthwhile.

Ontario Public Health Association

The three representatives from the Board of Directors of the Ontario Public Health Association to the Council of the Canadian Public Health Association are Miss Helen Fasken, President, Dr. G. K. Martin, Secretary, and Miss Margaret Cahoon.

The Ontario Public Health Association has undertaken to obtain opinions from the representatives of each section regarding the space and facilities necessary for carrying out a school health program.

News Notes

Federal

The Canadian delegation of the Thirteenth World Health Assembly, the governing body of the World Health Organization, which met in Geneva, Switzerland, beginning May 3 was headed by Dr. G. D. W. Cameron, Deputy Minister of National Health, with Mr. Max Weshof, Ambassador and Canadian Permanent Representative to the European Office of the United Nations in Geneva, as alternate head. Alternate delegates were Dr. W. G. Brown, Deputy Minister of Health for the Province of Ontario, and Dr. B. D. B.

Layton, Principal Medical Officer, Research Development and International Health Administration, Department of National Health and Welfare. Mr. Pierre Dumas, Canadian Permanent Mission, Geneva, was adviser to the delegation.

Madame A. Senecal, Information Office, of the Information Services Division, presented an exhibit on Fluoridation, for the College of General Practice Convention at Montreal, February 29–March 2.

Dr. William A. Prowse, chief of the Civil Aviation Medicine Division, conducted a two-day refresher course in civil aviation medicine for the Department of Transport civil aviation medical examiners of the Montreal region on March 10–11, and then attended a conference of the regional medical officers of the Civil Aviation Medicine Division, held in Montreal, March 12. Dr. Prowse also attended a recent course for physicists, physicians and others interested in space medicine, at the U.S. Air Force Aerospace Medical Research Centre, Brooks Air Force Base, San Antonio, Texas.

Dr. L. Greenberg, chief of the Biologics Control Laboratories, Laboratory of Hygiene, left early in March for Europe to visit pharmaceutical manufacturing establishments on the continent.

Dr. Jean F. Webb, chief of the Child and Maternal Health Division, and Miss Esther Robertson, Nursing Consultant for the same division, were guest speakers at the recent institute for nurses on maternal and infant care, held at Moncton, New Brunswick, by the University of New Brunswick School of Nursing.

Dr. D. Kubryk, Medical Consultant of the Epidemiology Division, and Dr. G. H. Josie, Principal Research Officer of the Biostatistics Section, Research and Statistics Division, attended a meeting at the Johns Hopkins University School of Public Health, February 2, 1960, with reference to a study to be undertaken in Baltimore and Los Angeles on leukaemia and radiation, similar to the one being carried out by the Epidemiology Division and the Research and Statistics Division of the Department.

Nova Scotia

The rehabilitation division of the Department of Public Health has appointed Alex. C. MacNeil as rehabilitation counsellor to cover Cobequid and Northumberland health units. Mr. MacNeil will make his headquarters at Pictou, in the office of the Northumberland Health Unit.

Dr. H. L. Scammell was appointed executive director of the Nova Scotia Alcoholism Research Foundation.

The staff meeting of the Lunenburg-Queens Health Unit was held in Bridgewater on April 4. Miss Irene Stafford who represented the health unit at the mental health institute presented a resume of the institute.

Quebec

Child Safety Day, May 1, was observed in at least four provinces in addition to Saskatchewan, which introduced the special day almost six years ago to direct attention to the child accident tragedy. Voluntary safety councils in Quebec, Ontario and Alberta, and an interdepartmental government committee in Manitoba indicated their intention to do their part in combating a shocking burden of death and disability among Canadian children.

Ontario

Mrs. Edna I. LaFlair, research assistant, School of Hygiene, University of Toronto, has resigned to accept an appointment as director of prenatal education classes for Metropolitan Toronto on August 1, 1960. Mrs. LaFlair has been working on the study of leukaemia and childhood malignancies with Dr. Harding leRiche. Mrs. Barbara Copeland, B.Sc.N. has been appointed as research assistant to continue this work.

At the School Health Section, Ontario Educational Association, April 20, Dr. H. W. Henderson, Director of Community Mental Health Services of the Ontario Department of Health spoke on "Mental Health Problems in School Children". Group discussions followed in which Dr. W. G. Watts, Etobicoke, Dr. A. M. Breuls, Scarborough, Dr. B. Russell, North York, and Miss Marion Woodside, Toronto Department of Health acted as resource persons. Dr. A. L. McKay, Director Community Health Services of the City of Toronto, was appointed chairman succeeding Dr. C. D. Farquharson, Scarborough. Miss Margaret Cahoon, Associate in Health Education, School of Hygiene, University of Toronto, and a staff member of the East York-Leaside Health Unit was presented with a Centennial Award by Dr. A. L. McKay on behalf of the School Health Section for service and leadership in education.

The thirty-eighth annual meeting of the American College Health Association was held in Toronto from April 27–30. The Chairman of the Local Arrangements Committee, and one of the Councillors of this association was G. E. Wodehouse, M.D., Director of Health Services, University of Toronto. Canadian speakers included Dr. C. T. Bissell, R. F. Farquharson, M.D., K. J. R. Wightman, M.D., A. B. Stokes, M.D., J. G. Dewan, M.D., J. H. Ebbs, M.D., Miss Mary Millman, B.A., and Miss J. Watson, M.Sc.N.

Dr. Harding leRiche, School of Hygiene, University of Toronto attended a meeting of the directors of community health adminis-

tration studies of the Kellogg Foundation in Washington, D.C., March 17, under the chairmanship of Dr. Wm. F. Mayes, Division of General Health Services, United States Public Health Services. Dr. leRiche reports that the Kellogg Foundation is financing a number of studies in the United States and Canada to investigate the future of public health, and that there is a trend in the United States to establish departments of research in the state health departments to evaluate existing adminstrative policies and to suggest future changes.

At the meeting of the Health Section of the Ontario Home and School Federation of the Ontario Educational Association, April 21, Dr. H. W. Henderson, Director of Community Mental Health Services gave an address on "Help Wanted—Urgent!". Dr. R. J. Wilson, Associate Professor of Public Health, Dr. G. W. O. Moss, Assistant Medical Officer of Health, City of Toronto Department of Health, and Dr. O Hall, Professor of Sociology, University of Toronto, discussed "Why Have Adults Not Accepted Salk Polio Vaccine?".

The Hon. Dr. Dymond has announced the appointment of a committee on physical fitness with Mr. Harry Price, past president of the Canadian National Exhibition as chairman and Brig. Michael S. Dunn as secretary. Other members are: Dr. J. Harry Ebbs, Prof. W. I. L'Heureux, D. L. McGregor, Zerada Slack and James Worrall. An amount of $35,000 has been provided to permit the committee to formulate a suitable program.

Manitoba

Dr. F. T. Cadham, Emeritus Professor of Bacteriology, University of Manitoba, has retired from the Manitoba Board of Health, following nearly 40 years of outstanding service. He was honored by the University of Manitoba last year with the degree LL.D.

Dr. Cadham received his M.D. from the University of Manitoba in 1905, and engaged in private practice from 1905 to 1910. In 1916, he was appointed to the civil service under the Provincial Board of Health. He was appointed Assistant Bacteriologist in 1919, and in 1923 a member of the Board of Health and Provincial Bacteriologist.

Dr. Cadham will be succeeded as chairman of the Board by E. D. Hudson, M.D., of Hamiota.

Director of Health and Public Welfare Education, Mr. R. E. Wendeborn, attended the Western Farm Safety Conference in Calgary, April 12–13.

Members of the nursing staff who attended the civil defence course at Arnprior during May included Miss Jessie Williamson, Director of Public Health Nursing, Miss Mary Wilson and Miss Ethel Elder, Nursing Consultants.

The Department of Health of the city of Winnipeg has commenced the publication of a news bulletin, the first issue appearing in January.

Dr. Carl Sorgor has been appointed assistant professor of pathology in the faculty of medicine.

Alberta

There have been two new appointments in the Provincial Department of Public Health. Dr. J. D. Wallace has been appointed to succeed Prof. J. D. Campbell as director of the Hospitals Division, and Dr. J. B. T. Wood has been appointed as medical consultant to the Division of Medical Services. Both are graduates of the University of Alberta, and bring with them to the department a wide experience of active practice; Dr. Wallace formerly practised at Wainwright, and Dr. Wood at High Prairie.

The annual conference of municipal nurses was held in the Provincial Department of Public Health, Edmonton, April 19–21. It was attended by about twenty nurses whose primary task is to carry out a public health nursing program, but who are also responsible for providing emergency treatment service in areas where medical care is not readily available.

A new health unit has been established in the town of Forest Lawn, adjacent to the city of Calgary. Mrs. Susan Harrop and Mrs. Lillian Hartzheim have been appointed as staff nurses.

A winter outbreak of poliomyelitis in Northern Alberta was recorded. The outbreak was in the district of La Crete, a small community approximately 500 miles northwest of Edmonton, this was reported by Dr. D. M. Cassidy of Fort Vermilion, Alberta. Since the middle of October when the outbreak began in this small community, there have been 18 cases of paralytic poliomyelitis, all among children aged 1–9. Five of these cases have been fatal. During the same period there were also 10 cases diagnosed as aseptic meningitis, ranging from 3 months to 6 years of age. Several multiple familial cases occurred. All virus isolations were of Type I.

Although information on the vaccination status of these cases is incomplete, it is known that community response to a vaccination program carried out last spring was extremely poor. During November, however, 371 vaccinations were given, most of them first doses. In addition, immune serum globulin was administered to 27 family case contacts.

Books and Reports

CHRONIC ILLNESS IN A RURAL AREA. *The Hunterdon Study. Reported by Ray E. Trussell, M.D., M.P.H. and Jack Elinson, Ph.D. Volume III of* Chronic Illness in the United States. *Published in Canada by S. J. Reginald Saunders and Co. Ltd., Toronto, 1959, 440 pp., $8.25.*

This volume completes a series of four reports on the problems of chronic illness in the United States which were published under the sponsorship of the Commission on Chronic Illness. Previous volumes were *Prevention of Chronic Illness* (1957), *Care of the Long Term Patient* (1956), *Chronic Illness in a Large City* (1957). The present volume is a companion to the urban study. Using many new approaches the authors present findings on chronic illness and its associated problems in a rural population. A recapitulation of the Hunterdon County Chronic Illness Survey is first presented. Hunterdon County is situated in northern New Jersey. The population was 42,736 in 1950. In the first chapter, "The Highlights of the Survey", are presented the most comprehensive series of research efforts yet undertaken in the United States to ascertain the chronic disease problems and the needs for care of a rural community. Many methodological problems in team research and health needs are discussed in complete detail. The complete series of four reports constitutes the most comprehensive and critical study of chronic illness yet published. Into the collection and analysis of the data have gone the best resources of modern medicine, statistics, and public health. This volume and its companion urban study (Vol. IV) merit close study by all who are concerned in public health and social medicine.

PUBLIC HEALTH IN THE TOWN OF BOSTON 1630-1822, *John B. Blake, S. J. Reginald Saunders, and Co. Ltd., Toronto, 1959, 278 pp., $7.15.*

The author is Dr. John B. Blake, curator of the Division of Medical Sciences of the Smithsonian Institution in Washington, D.C. This study, restricted in time to the period before Boston became a city (1630–1822), deals with the early years of the public health movement. The author outlines the development of public health practice from occasional emergency measures to a continued program of prevention and control of certain epidemic diseases. The introduction and increase in use of smallpox inoculation, and later, vaccination are described and the importance evaluated. The book also describes the further developments in the 1790's and the following two decades that resulted in a series of yellow fever epidemics in northern seaports, and the establishment of the board of health. The book is based almost exclusively on original sources of material.

This is a historical contribution of great value, providing an insight into the early development of public health on this continent.

A FIRST COURSE IN HYGIENE, *R. A. Lyster, Revised and rewritten, A. Leslie Banks, M.A., M.D., F.R.C.P.H., D.P.H. and J. A. Hislop, M.A., M.D., F.R.C.P. (Edin.).*

This popular general introduction to hygiene and public health has been revised and rewritten. The fact that this is the eleventh edition is proof of the value of this book in presenting anatomy, physiology, personal hygiene, environmental hygiene, tropical diseases, emergencies, administrative health services. It is in simple language with 161 figures. It can be highly recommended.

PHARMACOPOEA INTERNATIONALIS, *Editio Prima, Supplementum, World Health Organization, Geneva, Ryerson Press, 299 Queen Street West, Toronto, 1959, 224 pages, $5.00. Published also in French.*

The first edition, volumes I and II, appeared in 1951 and 1955 and has now been completed by the publication of a Supplement containing a further 94 monographs and 17 appendices. The complete first edition deals with a large proportion of new pharmaceutical preparations as well as with most of the classical therapeutic substances. It is a collection of recommended specifications which are intended to serve as references, so that national specifications can be established on a similar basis in any country.

NUTRITION AND ATHEROSCLEROSIS, *Louis N. Katz, M.D., Jeremiah Stamler, M.D., and Ruth Pick, M.D., The Macmillan Company of Canada Limited, 70 Bond Street, Toronto, 1959, 146 pp., $5.00.*

This volume presents a comprehensive review and appraisal of the rapidly developing field of atherosclerosis research. The bibliography contains 787 references. The authors have presented some positive practical suggestions for prophylaxis and therapy, believing that this is a positive approach to this disease problem. Those who are interested in atherosclerosis will find this volume of special interest.

A SHORT SYNOPSIS OF HUMAN PROTOZOOLOGY AND HELMINTHOLOGY, *L. R. S. Macfarlane, E. & S. Livingstone Ltd., Edinburgh and London, Macmillan Co. of Canada Ltd., 1960, 251 pp., 61 figs. $6.00.*

This unpretentious little book is based on notes used to prepare students for the D.T.M.H. at the Royal Army Medical College. There is a genuine need for a book of the scope and design of this one. It aims to provide students with the main features of human protozoa and helminths. The first 77 pages constitute a concise, well-illustrated summary of human protozoology. Each parasite is succinctly described and important facts about it (habitat, culture, life cycle, pathology, diagnosis) are given. The part dealing with helminths is less successful, mainly because there are too few figures and those given are far from the high standard set by the section on protozoa. In this section there are serious omissions and some parts are misleading. For example, no mention is made of the fact that *Thelazia* (misspelt "*Thalazia*") *callipaeda* is principally a parasite of the dog and the account of *Echinostoma* spp. would lead students to think only eggs of these species are found in man. Moreover, the author implies that kidney worm occurs only in America and China although there are at least 10 European records of it in man (Gutelle, 1953). The recent (1955) discovery of reservoir hosts of *Wuchereria malayi* is not mentioned and it may prove rash to state "man is the *only* definitive host" of *W. bancrofti* and *Onchocerca volvulus.*

R. C. Anderson

CULTURE AND MENTAL HEALTH, *Marvin K. Opler, Brett-Macmillan Ltd., Galt, Ontario. 1959, 533 pp., $8.75.*

The central theme of this volume is the variable effect of culture or cultural stress on mental health. 1960 has been designated as Mental Health Year in the international World Health Organization circle. It is appropriate to take stock of the position of behavioural sciences concerning the enormous problem of mental health. The volume, therefore, travels widely across the world carefully selecting studies which are well-informed by the social and psychological or psychiatric disciplines. Each of the 23 essays refers to some region of the world and has been written by an author of special competence.

The editor is Dr. Marvin K. Opler, an anthropologist and sociologist and now professor of social psychiatry in the University of Buffalo School of Medicine and Professor of Sociology in the University of Buffalo Graduate School. He is Associate Editor of the International Journal of Social Psychiatry. Those in public health reading this volume will become familiar with the field of social psychiatry and learn of the paths which will be followed in the next decade. The seven sections of the book deal with the American Indian, the people of the South Pacific, Asian contrasts, African contrasts, Anglo-American patterns, some modern problems, and world perspectives. There is also a helpful introduction by the editor.